



TECHNICAL MEMORANDUM

To: **Mary Aycock, U.S. EPA**
From: **Mark Gardiner, Aptim Diversified Services**
Subject: **Final TARP PFC Audit #2**
DCN: **500268-GE-000002**
Date: **November 1, 2018, Revised November 29, 2018**

1.0 INTRODUCTION

This technical memorandum summarizes audit and observation activities conducted at the Tucson Area Remediation Project (TARP) site on October 30, 2018. Mark Gardiner with Aptim Diversified Services (Aptim) conducted the audit on behalf of U.S. Environmental Protection Agency (EPA). TARP is part of the Tucson International Airport Area (TIAA) Superfund Site. The purpose of the audit was to observe Tucson Water personnel preparing for and collecting perfluorinated compound (PFC) samples at several sample point locations in the Tucson Water distribution system downstream from the TARP facility. Figures 1 and 2 show the sampling locations in the distribution system and at the TARP facility, respectively.

2.0 AUDIT ACTIVITIES

2.1 PFC Sampling

Five sample points were sampled in the part of the Tucson Water distribution system that receives treated water from the TARP facility. Photographs of the sampling points and sampling activities are attached to this memorandum (Attachment A). Each sample consists of filling two, 250 milliliter poly bottles with water from the sample port. The sample bottles are prepared by Tucson Water's laboratory subcontractor, Eurofins. The samples were collected in accordance with Eurofins' UCMR3 537 Perfluorinated Compounds Sampling Instructions; this procedure is included in TARP PFC Audit #1 (Aptim, 2018). The bottles contain 1.4 grams total of the preservatives Tris Hydrochloride and Tris (Hydroxymethyl) Aminomethane. The sample port valve was opened for several minutes to allow water to purge from the line. A sample from each port was then collected for field parameter measurements. Once field parameters were collected, the PFC sample bottles were filled. The chain of custody (COC) and sample label was then completed with time and date information. Sample results are anticipated for receipt between November 13, 2018 and



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November 20, 2018, based on the current analytical turnaround time for PFC at Eurofins of 2 to 3 weeks.

The sample points are identified as follows:

- 198R: Water leaving the Santa Cruz Lane Reservoir, located near S. Santa Cruz Lane and W. 34th Street.
- SP-830: Distribution sample point at 840 S. 10th Avenue.
- SP-810: Distribution sample point at 847 W. Alameda Street.
- SP-790: Distribution sample point at 905 N. 10th Avenue.
- SP-210: Distribution sample point at 2168 W. Splitwood Place.

These sample points are located at and downstream of the Santa Cruz Lane Reservoir after the TARP treated water has been blended with Central Arizona Project (CAP) water.

2.2 Analytical Results

Analytical results for the 5 sample points listed above and 3 additional sample points at the TARP facility prior to the treated water being blended with CAP water are summarized as Table 1, and the laboratory analytical report is provided as Attachment B. The analytical data for the October 30, 2018 samples were provided to Tucson Water on November 24, 2018, following revision of the chain of custody document to correct the sample date, and transmitted to EPA on November 28, 2018. The influent concentration result at TA-030A was 7.7 nanograms per liter or parts per trillion (ppt) total PFC. The effluent concentration leaving the TARP facility at TA-021T and prior to blending was 9.3 ppt total PFC. The concentration after blending and leaving the Santa Cruz Lane Reservoir at 198R was 6.2 ppt total PFC. Concentrations further downstream at sample points in the distribution system ranged from 2.8 ppt at SP-210 to 6.0 ppt total PFC at SP-790.

A field reagent blank (FRB) was collected with this set of samples, to ensure that PFC compounds were not introduced into the sample during sample collection and handling. This is described in Section 8.3 of EPA537, which was included in TARP PFC Audit #1 (Aptim, 2018). The FRB was collected with this set of samples at sample location TP-050T, and the results were non-detect for all analytes.

Table 1: PFC Sample Analytical Results from October 30, 2018 Sampling Event

Location Description	Sample Location	Result
AOP Influent (Raw Water)	TA-030A	7.7
AOP Effluent	TA-050T	10.3
Packed Column Aeration Effluent	TP-021T	9.3
Santa Cruz Lane Reservoir	198R	6.2
Distribution Sample Point	SP-830	3.0
Distribution Sample Point	SP-810	5.9
Distribution Sample Point	SP-790	6.0
Distribution Sample Point	SP-210	2.8

Note: Results in parts per trillion total combined PFOS and PFOA

3.0 OBSERVATIONS

No issues were observed with the execution of the PFC sampling. The Tucson Water sampler wore appropriate gloves (nitrile) and maintained appropriate procedure for sampling and avoiding cross-contamination of the samples. This is critical in sampling for PFC since they are prevalent in many products and in the environment. The samples were maintained under a COC and placed in a sample cooler to be shipped to Eurofins in California for analysis. It was determined subsequently that an incorrect sample date was listed on the COC, and was corrected after the sample results were obtained from Eurofins. The corrected COC is included in Attachment B.

4.0 RECOMMENDATIONS

- Recommend that the next audit activity be conducted with Tucson Water starting with a review of the piping systems associated with the point leaving the Santa Cruz Lane Reservoir and into the part of the distribution system that receives TARP treated water, and including a detailed explanation, time-line, and discussion of the original installation and subsequent use of sample point SP-830 to characterize TARP water entering the distribution system.
- Recommend that Tucson Water develop a formal sample procedure based on the Eurofins protocol and that the sampler have a copy of the sample procedure on hand during PFC sampling activities for reference if any questions. The sample procedure should have rigorous descriptions of materials that should and should not be in the sampling environment, including clothing, supplies, “blue ice” for sample



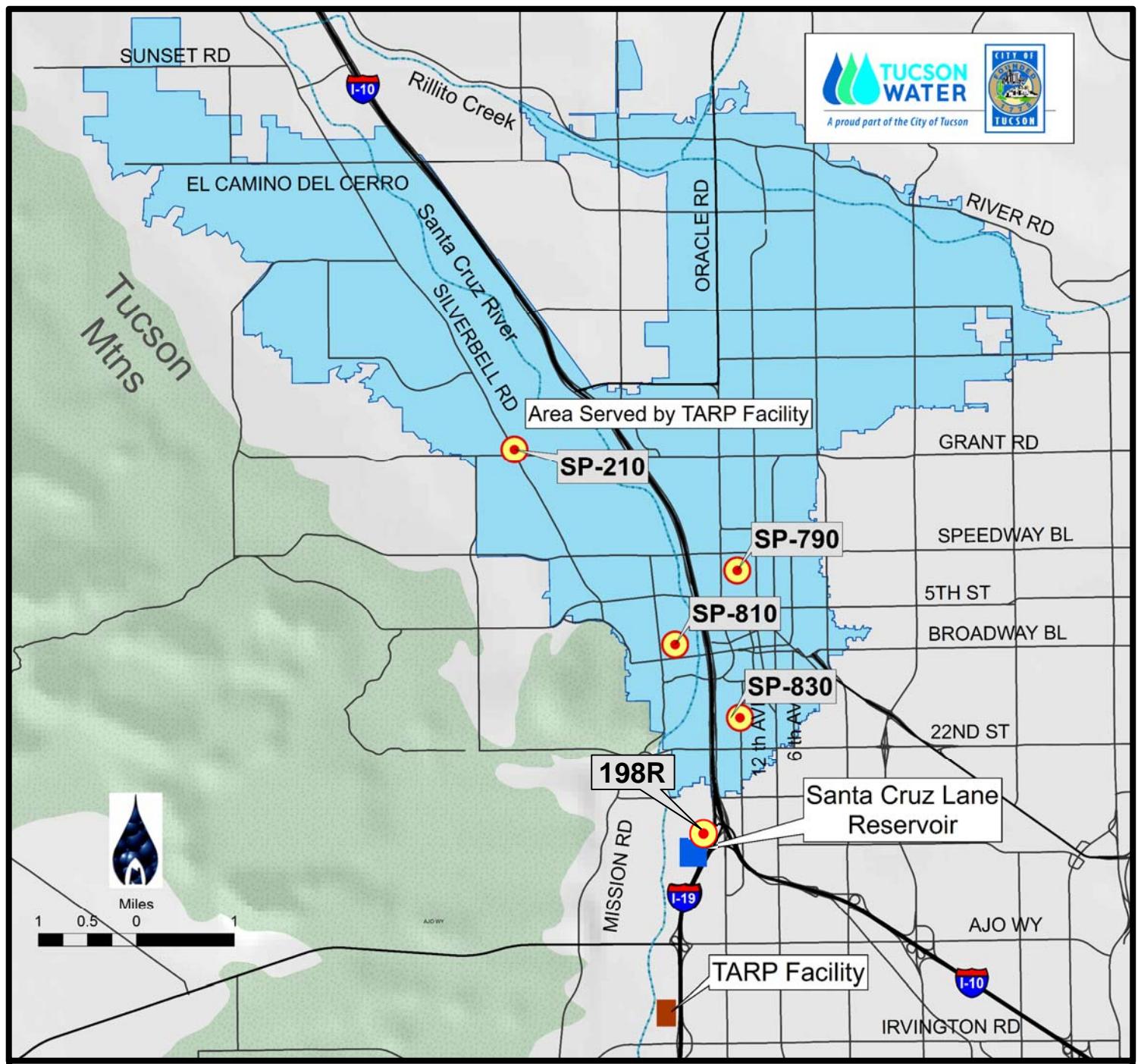
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preservation, and other items; how field clothing should be laundered; and details regarding the use of sunscreens and insect repellants.

- Request Tucson Water provide updated sample figures for the TARP facility and the distribution system sample points for the downstream points starting at the Santa Cruz Lane Reservoir on a weekly basis to include the most recent data available.

5.0 REFERENCES

Aptim, 2018, TARP PFC Audit #1, Rev. 2, TIAA Superfund Site, Tucson, Arizona, Prepared for U.S. EPA, November 1, 2018.



PFOA + PFOS Water Quality Sample Points Results

Sample	10/30/2018
SP-210	2.8
SP-790	6.0
SP-810	5.9
SP-830	3.0
198R	6.2

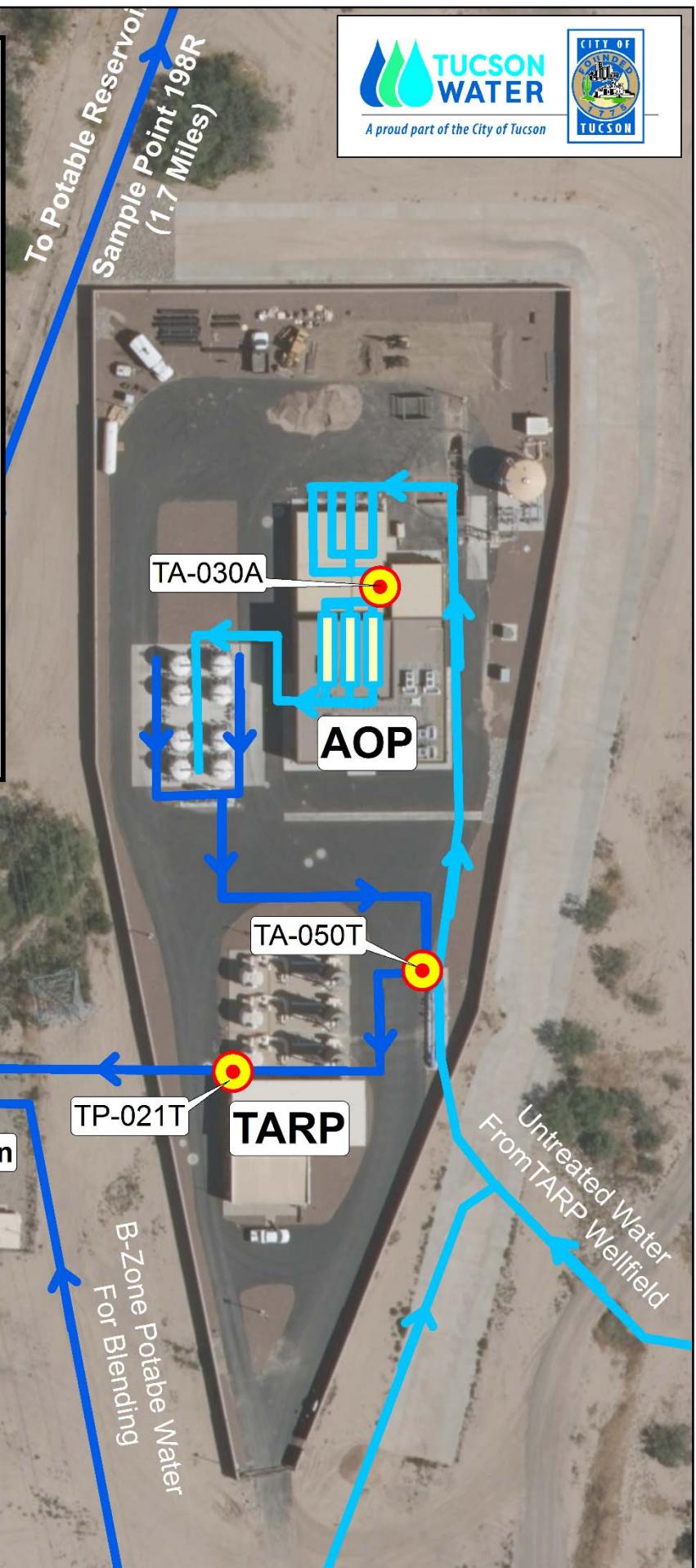
Figure 1

LEGEND

- Water Quality Sample Point (SP)
- Water Service Area (A Zone)

EPA Health Advisory is 70 PPT

Sample	PFOA +PFOS (PPT) 10/30/2018
Water from TARP Wells (TA-030A)	7.7
Water After AOP/Carbon (TA-050T)	10.3
Water After TARP Air Towers (TP-021T)	9.3
Potable Water After Blending (198R)	6.2



Legend

Figure 2

- TARP Main
 - Potable Main
- 50 25 0 50
- Feet



Sample Points at TARP/AOP Facilities



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ATTACHMENT A: Site Photographs



Santa Cruz Lane Reservoir Booster Station, view to the south



Santa Cruz Lane Reservoir, view to the west



Santa Cruz Lane Reservoir, view to the northwest



Sample location 198R, view to the west



Sample location SP-830, view to the west



Sample location SP-830, view to the south



Sampling at SP-830



Sample location SP-810, view to the east



Sampling at SP-810



Sample location SP-790, view to the west



Sample location SP-210, view to the east

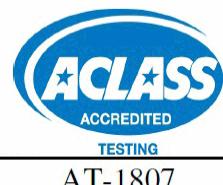


TECHNICAL MEMORANDUM

APTIM

ATTACHMENT B: Analytical Laboratory Report And Corrected COC

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)



Laboratory Report

for

Tucson City of
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735
Attention: Mike Dew
Fax: 520-791-5260

Date of Issue
11/24/2018


Thomas.D.French
Eurofins Eaton
Analytical, LLC

TDF: Thomas.D.French
Project Manager

Report:771346
Project:EDC-PPCP
ADHS License #:AZ0778
Group:EPA 537
PO#:PO#: 40258



Utah ELCP CA00006

* Accredited in accordance with TNI 2009 and ISO/IEC 17025:2005.

* Laboratory certifies that the test results meet all **TNI 2009 and ISO/IEC 17025:2005** requirements unless noted under the individual analysis.

* Following the cover page are State Certification List, ISO 17025 Accredited Method List, Acknowledgement of Samples Received, Comments, Hits Report, Data Report, QC Summary, QC Report and Regulatory Forms, as applicable.

* Test results relate only to the sample(s) tested.

* This report shall not be reproduced except in full, without the written approval of the laboratory.

STATE CERTIFICATION LIST

State	Certification Number	State	Certification Number
Alabama	41060	Mississippi	Certified
Arizona	AZ0778	Montana	Cert 0035
Arkansas	Certified	Nebraska	Certified
California-Monrovia-ELAP	2813	Nevada	CA000062018
California-Colton- ELAP	2812	New Hampshire *	2959
Colorado	Certified	New Jersey *	CA 008
Connecticut	PH-0107	New Mexico	Certified
Delaware	CA 006	New York *	11320
Florida *	E871024	North Carolina	06701
Georgia	947	North Dakota	R-009
Guam	18-005R	Oregon *	CA200003-005
Hawaii	Certified	Pennsylvania *	68-565
Idaho	Certified	Puerto Rico	Certified
Illinois *	200033	Rhode Island	LAO00326
Indiana	C-CA-01	South Carolina	87016
Iowa - Asbestos	413	South Dakota	Certified
Kansas *	E-10268	Tennessee	TN02839
Kentucky	90107	Texas *	T104704230-17-13
Louisiana *	LA180000	Utah (Primary AB) *	CA00006
Maine	CA0006	Vermont	VT0114
Maryland	224	Virginia *	460260
Commonwealth of Northern Marianas Is.	MP0004	Washington	C838
Massachusetts	M-CA006	EPA Region 5	Certified
Michigan	9906	Los Angeles County Sanitation Districts	10264

* NELAP/TNI Recognized Accreditation Bodies

ISO 17025 Accredited Method List

The tests listed below are accredited and meet the requirements of ISO 17025 as verified by the ANSI-ASQ National Accreditation Board/ANAB.
Refer to Certificate and scope of accreditation (AT 1807) found at: <http://www.eatonanalytical.com>

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Environmental (Drinking Water)	Environmental (Waste Water)	Component of Food and Bev/Bev/ Bottled Water
1,2,3-TCP (5 PPT & 0.5 PPT)	CA SRL 524M-TCP	x		x
1,4-Dioxane	EPA 522	x		x
2,3,7,8-TCDD	Modified EPA 1613B	x		x
Acrylamide	In House Method (2440)	x		x
Algal Toxins/Microcystin	In House Method (3570)			
Alkalinity	SM 2320B	x	x	x
Ammonia	EPA 350.1		x	x
Ammonia	SM 4500-NH3 H		x	x
Anions and DBPs by IC	EPA 300.0	x	x	x
Anions and DBPs by IC	EPA 300.1	x		x
Asbestos	EPA 100.2	x	x	
BOD / CBOD	SM 5210B		x	x
Bromate	In House Method (2447)	x		x
Carbamates	EPA 531.2	x		x
Carbonate as CO3	SM 2330B	x	x	x
Carbonyls	EPA 556	x		x
COD	EPA 410.4 / SM 5220D		x	
Chloramines	SM 4500-CL G	x	x	x
Chlorinated Acids	EPA 515.4	x		x
Chlorinated Acids	EPA 555	x		x
Chlorine Dioxide	SM 4500-CLO2 D Palin Test	x		x
Chlorine -Total/Free/ Combined Residua	SM 4500-Cl G	x	x	x
Conductivity	EPA 120.1		x	
Conductivity	SM 2510B	x	x	x
Corrosivity (Langlier Index)	SM 2330B	x		x
Cyanide, Amenable	SM 4500-CN G	x	x	
Cyanide, Free	SM 4500CN F	x	x	x
Cyanide, Total	EPA 335.4	x	x	x
Cyanogen Chloride (screen)	In House Method (2470)	x		x
Diquat and Paraquat	EPA 549.2	x		x
DBP/HAA	SM 6251B	x		x
Dissolved Oxygen	SM 4500-O G		x	x
DOC	SM 5310C	x		x
E. Coli	(MTF/EC+MUG)	x		x
E. Coli	CFR 141.21(f)(6)(i)	x		x
E. Coli	SM 9223		x	
E. Coli (Enumeration)	SM 9221B.1/ SM 9221F	x		x
E. Coli (Enumeration)	SM 9223B	x		x
EDB/DCBP	EPA 504.1	x		
EDB/DBCP and DBP	EPA 551.1	x		x
EDTA and NTA	In House Method (2454)	x		x
Endothall	EPA 548.1	x		x
Endothall	In-house Method (2445)	x		x
Enterococci	SM 9230B	x	x	
Fecal Coliform	SM 9221 E (MTF/EC)	x		
Fecal Coliform	SM 9221C, E (MTF/EC)		x	
Fecal Coliform (Enumeration)	SM 9221E (MTF/EC)	x		x
Fecal Coliform with Chlorine Present	SM 9221E		x	
Fecal Streptococci	SM 9230B	x	x	
Fluoride	SM 4500-F C	x	x	x
Glyphosate	EPA 547	x		x
Glyphosate + AMPA	In House Method (3618)	x		x
Gross Alpha/Beta	EPA 900.0	x	x	x
Gross Alpha Coprecipitation	SM 7110 C	x	x	x
Hardness	SM 2340B	x	x	x
Heterotrophic Bacteria	In House Method (2439)	x		x
Heterotrophic Bacteria	SM 9215 B	x		x
Hexavalent Chromium	EPA 218.6	x	x	x

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Environmental (Drinking Water)	Environmental (Waste Water)	Water as a Component of Food and Bev/Bev/ Bottled Water
Hexavalent Chromium	EPA 218.7	x		x
Hexavalent Chromium	SM 3500-Cr B		x	
Hormones	EPA 539	x		x
Hydroxide as OH Calc.	SM 2330B	x		x
Kjeldahl Nitrogen	EPA 351.2		x	
Legionella	Legioalert	x		x
Mercury	EPA 245.1	x	x	x
Metals	EPA 200.7 / 200.8	x	x	x
Microcystin LR	ELISA (2360)	x		x
Microcystin, Total	EPA 546	x		x
NDMA	EPA 521 In house method (2425)	x		x
Nitrate/Nitrite Nitrogen	EPA 353.2	x	x	x
OCL, Pesticides/PCB	EPA 505	x		x
Ortho Phosphate	EPA 365.1	x	x	x
Ortho Phosphorous	SM 4500P E	x		x
Oxyhalides Disinfection Byproducts	EPA 317.0	x		x
Perchlorate	EPA 331.0	x		x
Perchlorate (low and high)	EPA 314.0	x		x
Perfluorinated Alkyl Acids	EPA 537	x		x
Perfluorinated Pollutant	In house Method (2434)	x		x
pH	EPA 150.1	x		
pH	SM 4500-H+B	x	x	x
Phenylurea Pesticides/ Herbicides	In House Method, based on EPA 532 (2448)	x		x
Pseudomonas	IDEXX Pseudalert (2461)	x		x
Radium-226	GA Institute of Tech	x		x
Radium-228	GA Institute of Tech	x		x
Radon-222	SM 7500RN	x		x
Residue, Filterable	SM 2540C	x	x	x
Residue, Non-filterable	SM 2540D		x	
Residue, Total	SM 2540B		x	x
Residue, Volatile	EPA 160.4		x	
Semi-VOC	EPA 525.2	x		x
Silica	SM 4500-Si D	x	x	
Silica	SM 4500-SiO2 C	x	x	
Sulfide	SM 4500-S ⁻ D		x	
Sulfite	SM 4500-SO ³ B	x	x	x
Surfactants	SM 5540C	x	x	x
Taste and Odor Analytes	SM 6040E	x		x
Total Coliform (P/A)	SM 9221 A, B	x		x
Total Coliform (Enumeration)	SM 9221 A, B, C	x		x
Total Coliform / E. coli	Colisure SM 9223	x		x
Total Coliform	SM 9221B		x	
Total Coliform with Chlorine Present	SM 9221B		x	
Total Coliform / E.coli (P/A and Enumeration)	SM 9223	x		x
TOC	SM 5310C	x	x	x
TOX	SM 5320B		x	
Total Phenols	EPA 420.1		x	
Total Phenols	EPA 420.4	x	x	x
Total Phosphorous	SM 4500 P E		x	
Triazine Pesticides & Degradates	In House (3617)	x		x
Turbidity	EPA 180.1	x	x	x
Turbidity	SM 2130B	x	x	
Uranium by ICP/MS	EPA 200.8	x		x
UV 254	SM 5910B	x		
VOC	EPA 524.2	x		x
VOC	In House Method (2411)	x		x
Yeast and Mold	SM 9610	x		x

Acknowledgement of Samples Received

Addr: **Tucson City of**
 Water Quality Laboratory
 4401 S. Tucson Estates Parkway
 Tucson, AZ 85735

Attn: Mike Dew
 Phone: 520-837-2455

Client ID: TUCSONWATER
 Folder #: 771346
 Project: EDC-PPCP
 Sample Group: EPA 537

Project Manager: Thomas.D.French
 Phone: (480) 778-1558
 PO #: 40258

The following samples were received from you on **November 02, 2018 at 1500**. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact your service representative. Thank you for using Eurofins Eaton Analytical, LLC.

Sample #	Sample ID	Sample Date
<u>201811020069</u>	198R @537	10/30/2018 0844
<u>201811020071</u>	SP-830 @537	10/30/2018 0908
<u>201811020072</u>	SP-810 @537	10/30/2018 0927
<u>201811020073</u>	SP-790 @537	10/30/2018 0954
<u>201811020074</u>	SP-210 @537	10/30/2018 1010
<u>201811020075</u>	TA-030A @537	10/30/2018 0821
<u>201811020076</u>	TA-050T @537	10/30/2018 0814
<u>201811020077</u>	FIELD REAGENT BLANK @537 FB @537 TB	10/30/2018 0814
<u>201811020078</u>	TP-021T @537	10/30/2018 0806
<u>201811020079</u>	A-060A @537	11/01/2018 0741
<u>201811020080</u>	AV-003A @537	11/01/2018 0634
<u>201811020081</u>	B-051B @537	11/01/2018 0841
<u>201811020082</u>	C-076A @537	11/01/2018 0909

Acknowledgement of Samples Received

Addr: **Tucson City of**
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

Attn: Mike Dew
Phone: 520-837-2455

Client ID: TUCSONWATER
Folder #: 771346
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The following samples were received from you on **November 02, 2018 at 1500**. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact your service representative. Thank you for using Eurofins Eaton Analytical, LLC.

Sample #	Sample ID	Sample Date
	@537	

Test Description

- @537 -- Perfluorinated Alkyl Acids
- @537 FB -- Perfluorinated Alkyl Acids
- @537 TB -- Perfluorinated Alkyl Acids

CHAIN OF CUSTODY RECORD

750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629

Phone: 626 386 1100
Fax: 626 386 1101

800 566 LABS (800 566 5227)

Website: www.EatonAnalytical.com

EUROFINS EATON ANALYTICAL USE ONLY:

LOGIN COMMENTS:

SAMPLE TEMP RECEIVED AT: <input type="checkbox"/> Colton / No. California / Arizona <input checked="" type="checkbox"/> Monrovia		CONDITION OF BLUE ICE: <input type="checkbox"/> Frozen <input checked="" type="checkbox"/> Partially Frozen <input type="checkbox"/> UPS / FedEx / Walk-In / Other: _____	
METHOD OF SHIPMENT: Pick-Up / Top Line / Area Fast / DHL / Wet Ice <input checked="" type="checkbox"/> No Ice _____			
(check for yes)			

SAMPLES CHECKED AGAINST COC BY: CeeSAMPLES LOGGED IN BY: CeeSAMPLES REC'D DAY OF COLLECTION? (check for yes)°C (Compliance: 4 ± 2 °C) 1.5°C (Compliance: 4 ± 2 °C) 1.5Wet Ice Thawed No Ice

TO BE COMPLETED BY SAMPLER:

COMPANY/AGENCY NAME: TUCSON WATER DEPARTMENT		PROJECT CODE: EDC-PPCP	COMPLIANCE SAMPLES - Requires state forms <input type="checkbox"/>		NON-COMPLIANCE SAMPLES <input checked="" type="checkbox"/>	
EEA CLIENT CODE: TUCSONWATER	COC ID:	SAMPLE GROUP: EPA 537	Type of samples (circle one):	ROUTINE	SPECIAL	CONFIRMATION <input type="checkbox"/>
TAT requested: rush by adv notice only		STD <input type="checkbox"/> 1 wk <input checked="" type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input type="checkbox"/> 1 day <input type="checkbox"/>	FIELD DATA	FIELD DATA	FIELD DATA	SAMPLER COMMENTS
SAMPLE DATE	TIME	SAMPLE ID	CLIENT LAB ID	MATRIX *	④537-FB	
10/31/18 08:44	09:44	198R	L181453-01	CFW	2	
10/31/18 08:48	09:48	SP-830	L181453-02	CFW	2	
10/31/18 08:49:27	09:49:27	SP-810	L181453-03	CFW	2	
10/31/18 08:54:44	09:54:44	SP-790	L181453-04	CFW	2	
10/31/18 08:56:32	09:56:32	SP-210	L181453-05	CFW	2	
10/31/18 08:57:21	09:57:21	TA-030A	L181453-06	RGW	2	
10/31/18 08:57:49	09:57:49	TA-050T	L181453-07	FW	2	
10/31/18 08:58:14	09:58:14	FIELD BLANK TA-050T	L181453-08		1	
10/31/18 08:58:56	09:58:56	TP-021T	L181453-09	CFW	2	
10/31/18 09:02:41	09:02:41	A-060A	L181453-10	CFW	2	

* MATRIX TYPES: RSW = Raw Surface Water
SEAW = Sea Water
FW = Raw Ground Water
RGW = Other Finished Water

BW = Bottled Water
WW = Waste Water

SO = Soil
SL = Sludge

O = Other - Please Identify
DATE 10/18/18 TIME 10:15

PRINT NAME Victor Plascencia
COMPANY/TITLE Tucson Water Department

SAMPLED BY: Charles Charles
RELINQUISHED BY: Charles Charles

RECEIVED BY: Diane Frayzel
RELINQUISHED BY: Diane Frayzel

RECEIVED BY: UPS 12 YR8 0216 019025 8200
RECEIVED BY: UPS 12 YR8 0216 019025 8200



Eaton Analytical

CHAIN OF CUSTODY RECORD

EUROFINS EATON ANALYTICAL USE ONLY

750 Royal Oaks Drive, Suite 100
Montovia, CA 91016-3629

Phone: 626 386 1100
Fax: 626 386 1101

800 566 LABS (800 566 5227)

Website: www.EatonAnalytical.com

LOGIN COMMENTS:	SAMPLES CHECKED AGAINST COC BY: <u>CJ</u>
SAMPLE TEMP RECEIVED AT:	SAMPLES LOGGED IN BY: <u>CJ</u>
<input type="checkbox"/> Colton / No. California / Arizona <input checked="" type="checkbox"/> Montrovia	SAMPLES REC'D DAY OF COLLECTION? <input type="checkbox"/> (check for yes)
CONDITION OF BLUE ICE: Frozen <input checked="" type="checkbox"/> <input type="checkbox"/> Partially Frozen <input checked="" type="checkbox"/> <input type="checkbox"/> Thawed <input type="checkbox"/> <input type="checkbox"/> Wet Ice <input checked="" type="checkbox"/> <input type="checkbox"/> No Ice _____	°C (Compliance: 4 ± 2 °C) <u>1.5</u> °C (Compliance: 4 ± 2 °C)
METHOD OF SHIPMENT: Pick-Up / Walk-In / FedEx / UPS / DHL / Area Fast / Top Line / Other: <u>UPS</u>	

CFW = Chlor(am)inated Finished Water

RGW = Raw Ground Water FW = Other Finished Water

TIME

DATE

PAGE

DATE 11/21/19 TIME 6:14
COMPANY/TITLE

COMPANY/TITLE CER DATE 11/24/04 TIME

STATE/COURT/ST 111 118 10:15

WILHELM CLOETE (3) 111

10:15 AM 22/01/2018

1 = 1 = 18 1020

MAGIR / ANKESI 11-18 120

11-1-18
NATL YARD
11-1-18
1500

1-1-18 15M

300

PAGE 2 OF 2

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Tel: (626) 386-1100
 Fax: (866) 988-3757
 1 800 566 LABS (1 800 566 5227)

Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
 Mike Dew
 Water Quality Laboratory
 4401 S. Tucson Estates Parkway
 Tucson, AZ 85735

Samples Received on:
 11/02/2018 1500

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
		201811020069 <u>198R</u>				
11/06/2018 22:46	Perfluorobutanesulfonic acid		0.0032		ug/L	0.0018
11/06/2018 22:46	Perfluorohexanesulfonic acid		0.018		ug/L	0.0018
11/06/2018 22:46	Perfluorohexanoic acid		0.0054		ug/L	0.002
11/06/2018 22:46	Perfluoroctanesulfonic acid		0.0042		ug/L	0.0019
11/06/2018 22:46	Perfluoroctanoic acid		0.0020		ug/L	0.002
		201811020071 <u>SP-830</u>				
11/06/2018 23:08	Perfluorobutanesulfonic acid		0.0023		ug/L	0.0018
11/06/2018 23:08	Perfluorohexanesulfonic acid		0.013		ug/L	0.0018
11/06/2018 23:08	Perfluorohexanoic acid		0.0037		ug/L	0.002
11/06/2018 23:08	Perfluoroctanesulfonic acid		0.0030		ug/L	0.0019
		201811020072 <u>SP-810</u>				
11/06/2018 23:30	Perfluorobutanesulfonic acid		0.0033		ug/L	0.0018
11/06/2018 23:30	Perfluorohexanesulfonic acid		0.018		ug/L	0.0018
11/06/2018 23:30	Perfluorohexanoic acid		0.0046		ug/L	0.002
11/06/2018 23:30	Perfluoroctanesulfonic acid		0.0038		ug/L	0.0019
11/06/2018 23:30	Perfluoroctanoic acid		0.0021		ug/L	0.002
		201811020073 <u>SP-790</u>				
11/06/2018 23:51	Perfluorobutanesulfonic acid		0.0034		ug/L	0.0018
11/06/2018 23:51	Perfluorohexanesulfonic acid		0.018		ug/L	0.0018
11/06/2018 23:51	Perfluorohexanoic acid		0.0052		ug/L	0.002
11/06/2018 23:51	Perfluoroctanesulfonic acid		0.0039		ug/L	0.0019
11/06/2018 23:51	Perfluoroctanoic acid		0.0021		ug/L	0.002
		201811020074 <u>SP-210</u>				
11/07/2018 00:56	Perfluorobutanesulfonic acid		0.0024		ug/L	0.0018
11/07/2018 00:56	Perfluorohexanesulfonic acid		0.012		ug/L	0.0018
11/07/2018 00:56	Perfluorohexanoic acid		0.0031		ug/L	0.002
11/07/2018 00:56	Perfluoroctanesulfonic acid		0.0028		ug/L	0.0019
		201811020075 <u>TA-030A</u>				
11/07/2018 01:18	Perfluorobutanesulfonic acid		0.0044		ug/L	0.0018
11/07/2018 01:18	Perfluoroheptanoic acid		0.0022		ug/L	0.002
11/07/2018 01:18	Perfluorohexanesulfonic acid		0.028		ug/L	0.0018
11/07/2018 01:18	Perfluorohexanoic acid		0.0066		ug/L	0.002
11/07/2018 01:18	Perfluoroctanesulfonic acid		0.0047		ug/L	0.0019
11/07/2018 01:18	Perfluoroctanoic acid		0.0030		ug/L	0.002

SUMMARY OF POSITIVE DATA ONLY

Tel: (626) 386-1100
 Fax: (866) 988-3757
 1 800 566 LABS (1 800 566 5227)

Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
 Mike Dew
 Water Quality Laboratory
 4401 S. Tucson Estates Parkway
 Tucson, AZ 85735

Samples Received on:
 11/02/2018 1500

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
		201811020076 TA-050T				
11/07/2018 01:39	Perfluorobutanesulfonic acid		0.0056		ug/L	0.0018
11/07/2018 01:39	Perfluoroheptanoic acid		0.0023		ug/L	0.002
11/07/2018 01:39	Perfluorohexanesulfonic acid		0.033		ug/L	0.0018
11/07/2018 01:39	Perfluorohexanoic acid		0.0081		ug/L	0.002
11/07/2018 01:39	Perfluorooctanesulfonic acid		0.0071		ug/L	0.0019
11/07/2018 01:39	Perfluorooctanoic acid		0.0032		ug/L	0.002
		201811020078 TP-021T				
11/07/2018 02:01	Perfluorobutanesulfonic acid		0.0059		ug/L	0.0018
11/07/2018 02:01	Perfluorohexanesulfonic acid		0.032		ug/L	0.0018
11/07/2018 02:01	Perfluorohexanoic acid		0.0083		ug/L	0.002
11/07/2018 02:01	Perfluorooctanesulfonic acid		0.0063		ug/L	0.0019
11/07/2018 02:01	Perfluorooctanoic acid		0.0030		ug/L	0.002

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Tucson City of
Mike Dew
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

REVISED Report. Sample dates corrected as per client request. TDF 11242108

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Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
Mike Dew
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

Samples Received on:
11/02/2018 1500

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
<u>198R (201811020069)</u> Sampled on 10/30/2018 0844									

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	N-methyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	0.0032	ug/L	0.0018	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	0.018	ug/L	0.0018	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	0.0054	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluorooctanesulfonic acid	0.0042	ug/L	0.0019	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluoroctanoic acid	0.0020	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	13C-PFDA	87	%	1	
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	13C-PFHxA	95	%	1	
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	13C-PFOA	113	%	1	
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	13C-PFOS	107	%	1	
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	d3-NMeFOSAA	113	%	1	
11/05/18	11/06/18 22:46	1129022	1130091	(EPA 537)	d5-NEtFOSAA	86	%	1	

SP-830 (201811020071)
Sampled on 10/30/2018 0908
EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	N-methyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	0.0023	ug/L	0.0018	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	0.013	ug/L	0.0018	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	0.0037	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorooctanesulfonic acid	0.0030	ug/L	0.0019	1

Rounding on totals after summation.
(c) - indicates calculated results

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Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
Mike Dew
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

Samples Received on:
11/02/2018 1500

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorooctanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	13C-PFDA	96	%	1	
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	13C-PFHxA	99	%	1	
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	13C-PFOA	109	%	1	
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	13C-PFOS	102	%	1	
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	d3-NMeFOSAA	105	%	1	
11/05/18	11/06/18 23:08	1129022	1130091	(EPA 537)	d5-NEtFOSAA	96	%	1	

SP-810 (201811020072)

Sampled on 10/30/2018 0927

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	N-methyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	0.0033	ug/L	0.0018	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	0.018	ug/L	0.0018	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	0.0046	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorooctanesulfonic acid	0.0038	ug/L	0.0019	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorooctanoic acid	0.0021	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	13C-PFDA	88	%	1	
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	13C-PFHxA	91	%	1	
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	13C-PFOA	113	%	1	
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	13C-PFOS	109	%	1	
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	d3-NMeFOSAA	113	%	1	
11/05/18	11/06/18 23:30	1129022	1130091	(EPA 537)	d5-NEtFOSAA	86	%	1	

SP-790 (201811020073)

Sampled on 10/30/2018 0954

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
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Rounding on totals after summation.
(c) - indicates calculated results

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
Mike Dew
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

Samples Received on:
11/02/2018 1500

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	N-methyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	0.0034	ug/L	0.0018	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	0.018	ug/L	0.0018	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	0.0052	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluoroctanesulfonic acid	0.0039	ug/L	0.0019	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluoroctanoic acid	0.0021	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	13C-PFDA	105	%	1	
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	13C-PFHxA	110	%	1	
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	13C-PFOA	111	%	1	
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	13C-PFOS	100	%	1	
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	d3-NMeFOSAA	103	%	1	
11/05/18	11/06/18 23:51	1129022	1130091	(EPA 537)	d5-NEtFOSAA	113	%	1	

SP-210 (201811020074)

Sampled on 10/30/2018 1010

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	N-ethyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	N-methyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	0.0024	ug/L	0.0018	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	0.012	ug/L	0.0018	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	0.0031	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluoroctanesulfonic acid	0.0028	ug/L	0.0019	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluoroctanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	13C-PFDA	92	%	1	

Rounding on totals after summation.
(c) - indicates calculated results

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Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
Mike Dew
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

Samples Received on:
11/02/2018 1500

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	13C-PFHxA	97	%		1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	13C-PFOA	117	%		1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	13C-PFOS	103	%		1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	d3-NMeFOSAA	108	%		1
11/05/18	11/07/18 00:56	1129022	1130091	(EPA 537)	d5-NEtFOSAA	94	%		1

TA-030A (201811020075)

Sampled on 10/30/2018 0821

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	N-methyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	0.0044	ug/L	0.0018	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	0.0022	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	0.028	ug/L	0.0018	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	0.0066	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorooctanesulfonic acid	0.0047	ug/L	0.0019	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorooctanoic acid	0.0030	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	13C-PFDA	95	%		1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	13C-PFHxA	89	%		1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	13C-PFOA	111	%		1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	13C-PFOS	102	%		1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	d3-NMeFOSAA	107	%		1
11/05/18	11/07/18 01:18	1129022	1130091	(EPA 537)	d5-NEtFOSAA	96	%		1

TA-050T (201811020076)

Sampled on 10/30/2018 0814

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	N-methyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	0.0056	ug/L	0.0018	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1

Rounding on totals after summation.
(c) - indicates calculated results

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
Mike Dew
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

Samples Received on:
11/02/2018 1500

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	0.0023	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	0.033	ug/L	0.0018	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	0.0081	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorooctanesulfonic acid	0.0071	ug/L	0.0019	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorooctanoic acid	0.0032	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	13C-PFDA	89	%	1	
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	13C-PFHxA	96	%	1	
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	13C-PFOA	111	%	1	
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	13C-PFOS	104	%	1	
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	d3-NMeFOSAA	106	%	1	
11/05/18	11/07/18 01:39	1129022	1130091	(EPA 537)	d5-NEtFOSAA	91	%	1	

FIELD REAGENT BLANK (201811020077)

Sampled on 10/30/2018 0814

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	N-methyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorooctanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorooctanesulfonic acid	ND	ug/L	0.0019	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorooctanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	13C-PFDA	91	%	1	
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	13C-PFHxA	70	%	1	
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	13C-PFOA	116	%	1	
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	13C-PFOS	104	%	1	
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	d3-NMeFOSAA	109	%	1	

Rounding on totals after summation.
(c) - indicates calculated results

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
Mike Dew
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

Samples Received on:
11/02/2018 1500

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/05/18	11/06/18 21:20	1129022	1130091	(EPA 537)	d5-NEtFOSAA	96	%		1
TP-021T (201811020078)									

Sampled on 10/30/2018 0806

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	N-ethyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	N-methyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	0.0059	ug/L	0.0018	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	0.032	ug/L	0.0018	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	0.0083	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluoroctanesulfonic acid	0.0063	ug/L	0.0019	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluoroctanoic acid	0.0030	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	13C-PFDA	88	%		1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	13C-PFHxA	93	%		1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	13C-PFOA	113	%		1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	13C-PFOS	103	%		1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	d3-NMeFOSAA	108	%		1
11/05/18	11/07/18 02:01	1129022	1130091	(EPA 537)	d5-NEtFOSAA	88	%		1

Sampled on 11/01/2018 0741

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	N-ethyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	N-methyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1

Rounding on totals after summation.
(c) - indicates calculated results

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
Mike Dew
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

Samples Received on:
11/02/2018 1500

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluorooctanesulfonic acid	ND	ug/L	0.0019	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluoroctanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	13C-PFDA	90	%		1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	13C-PFHxA	91	%		1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	13C-PFOA	116	%		1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	13C-PFOS	108	%		1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	d3-NMeFOSAA	110	%		1
11/05/18	11/07/18 02:22	1129022	1130091	(EPA 537)	d5-NEtFOSAA	92	%		1

AV-003A (201811020080)

Sampled on 11/01/2018 0634

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	N-methyl Perfluorooctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluorooctanesulfonic acid	ND	ug/L	0.0019	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluoroctanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	13C-PFDA	94	%		1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	13C-PFHxA	100	%		1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	13C-PFOA	115	%		1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	13C-PFOS	108	%		1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	d3-NMeFOSAA	108	%		1
11/05/18	11/07/18 02:44	1129022	1130091	(EPA 537)	d5-NEtFOSAA	104	%		1

B-051B (201811020081)

Sampled on 11/01/2018 0841

EPA 537 - Perfluorinated Alkyl Acids

Rounding on totals after summation.
(c) - indicates calculated results

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
Mike Dew
Water Quality Laboratory
4401 S. Tucson Estates Parkway
Tucson, AZ 85735

Samples Received on:
11/02/2018 1500

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	N-ethyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	N-methyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluoroctanesulfonic acid	ND	ug/L	0.0019	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluoroctanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	13C-PFDA	89	%		1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	13C-PFHxA	94	%		1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	13C-PFOA	114	%		1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	13C-PFOS	109	%		1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	d3-NMeFOSAA	110	%		1
11/05/18	11/07/18 03:06	1129022	1130091	(EPA 537)	d5-NEtFOSAA	93	%		1

C-076A (201811020082)

Sampled on 11/01/2018 0909

EPA 537 - Perfluorinated Alkyl Acids

11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	N-ethyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	N-methyl Perfluoroctanesulfonamidoacetic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluorobutanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluorodecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluorododecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluoroheptanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluorohexanesulfonic acid	ND	ug/L	0.0018	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluorohexanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluorononanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluoroctanesulfonic acid	ND	ug/L	0.0019	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluoroctanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluorotetradecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluorotridecanoic acid	ND	ug/L	0.002	1

Rounding on totals after summation.
(c) - indicates calculated results

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 1 800 566 LABS (1 800 566 5227)

Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of
 Mike Dew
 Water Quality Laboratory
 4401 S. Tucson Estates Parkway
 Tucson, AZ 85735

Samples Received on:
 11/02/2018 1500

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	Perfluoroundecanoic acid	ND	ug/L	0.002	1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	13C-PFDA	94	%		1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	13C-PFHxA	101	%		1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	13C-PFOA	107	%		1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	13C-PFOS	101	%		1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	d3-NMeFOSAA	106	%		1
11/05/18	11/07/18 03:27	1129022	1130091	(EPA 537)	d5-NEtFOSAA	94	%		1

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1 800 566 LABS (1 800 566 5227)

Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of

Perfluorinated Alkyl Acids

Prep Batch: 1129022 Analytical Batch: 1130091

201811020069	198R
201811020071	SP-830
201811020072	SP-810
201811020073	SP-790
201811020074	SP-210
201811020075	TA-030A
201811020076	TA-050T
201811020077	FIELD REAGENT BLANK
201811020078	TP-021T
201811020079	A-060A
201811020080	AV-003A
201811020081	B-051B
201811020082	C-076A

Analysis Date: 11/06/2018

Analyzed by: LHZ

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Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
Perfluorinated Alkyl Acids by EPA 537									
Prep Batch: 1129022 Analytical Batch: 1130091									
Analysis Date: 11/06/2018									
LCS1	13C-PFDA (S)		109	%	109	(70-130)			
LCS2	13C-PFDA (S)		97.6	%	98	(70-130)			
MBLK	13C-PFDA (S)		86.9	%	87	(70-130)			
MRL_CHK	13C-PFDA (S)		91.6	%	92	(70-130)			
MS_201810310303	13C-PFDA (S)		105	%	105	(70-130)			
MSD_201810310303	13C-PFDA (S)		93.6	%	94	(70-130)			
LCS1	13C-PFHxA (S)		105	%	105	(70-130)			
LCS2	13C-PFHxA (S)		92.8	%	93	(70-130)			
MBLK	13C-PFHxA (S)		88.9	%	89	(70-130)			
MRL_CHK	13C-PFHxA (S)		73.9	%	74	(70-130)			
MS_201810310303	13C-PFHxA (S)		98.5	%	98	(70-130)			
MSD_201810310303	13C-PFHxA (S)		88.6	%	89	(70-130)			
LCS1	13C-PFOA (I)		117	%	117	(50-150)			
LCS2	13C-PFOA (I)		120	%	120	(50-150)			
MBLK	13C-PFOA (I)		119	%	119	(50-150)			
MRL_CHK	13C-PFOA (I)		119	%	119	(50-150)			
MS_201810310303	13C-PFOA (I)		122	%	122	(50-150)			
MSD_201810310303	13C-PFOA (I)		124	%	124	(50-150)			
LCS1	13C-PFOS (I)		111	%	111	(50-150)			
LCS2	13C-PFOS (I)		111	%	111	(50-150)			
MBLK	13C-PFOS (I)		110	%	110	(50-150)			
MRL_CHK	13C-PFOS (I)		109	%	109	(50-150)			
MS_201810310303	13C-PFOS (I)		115	%	115	(50-150)			
MSD_201810310303	13C-PFOS (I)		116	%	116	(50-150)			
LCS1	d3-NMeFOSAA (I)		118	%	118	(50-150)			
LCS2	d3-NMeFOSAA (I)		121	%	121	(50-150)			
MBLK	d3-NMeFOSAA (I)		114	%	114	(50-150)			
MRL_CHK	d3-NMeFOSAA (I)		115	%	115	(50-150)			
MS_201810310303	d3-NMeFOSAA (I)		123	%	123	(50-150)			
MSD_201810310303	d3-NMeFOSAA (I)		122	%	122	(50-150)			
LCS1	d5-NEtFOSAA (S)		103	%	103	(70-130)			
LCS2	d5-NEtFOSAA (S)		95.5	%	96	(70-130)			
MBLK	d5-NEtFOSAA (S)		87.2	%	87	(70-130)			
MRL_CHK	d5-NEtFOSAA (S)		95.1	%	95	(70-130)			
MS_201810310303	d5-NEtFOSAA (S)		102	%	102	(70-130)			

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

RPD not calculated for LCS2 when different a concentration than LCS1 is used.

RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).

(S) - Indicates surrogate compound.

(I) - Indicates internal standard compound.

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Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
MSD_201810310303	d5-NEtFOSAA (S)			93.5	%	94	(70-130)		
LCS1	N-ethyl Perfluorooctanesulfonamidoacetic acid		0.025	0.0217	ug/L	87	(70-130)		
LCS2	N-ethyl Perfluorooctanesulfonamidoacetic acid		0.025	0.0212	ug/L	85	(70-130)	30	2.3
MBLK	N-ethyl Perfluorooctanesulfonamidoacetic acid			<0.000667	ug/L				
MRL_CHK	N-ethyl Perfluorooctanesulfonamidoacetic acid		0.002	0.00198	ug/L	99	(50-150)		
MS_201810310303	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	0.002	0.00190	ug/L	93	(50-150)		
MSD_201810310303	N-ethyl Perfluorooctanesulfonamidoacetic acid	ND	0.002	0.00192	ug/L	94	(50-150)	50	1.3
LCS1	N-methyl Perfluorooctanesulfonamidoacetic acid		0.025	0.0216	ug/L	86	(70-130)		
LCS2	N-methyl Perfluorooctanesulfonamidoacetic acid		0.025	0.0217	ug/L	87	(70-130)	30	0.46
MBLK	N-methyl Perfluorooctanesulfonamidoacetic acid			<0.000667	ug/L				
MRL_CHK	N-methyl Perfluorooctanesulfonamidoacetic acid		0.002	0.00199	ug/L	100	(50-150)		
MS_201810310303	N-methyl Perfluorooctanesulfonamidoacetic acid	ND	0.002	0.00195	ug/L	95	(50-150)		
MSD_201810310303	N-methyl Perfluorooctanesulfonamidoacetic acid	ND	0.002	0.00180	ug/L	88	(50-150)	50	7.8
LCS1	Perfluorobutanesulfonic acid		0.022	0.0197	ug/L	89	(70-130)		
LCS2	Perfluorobutanesulfonic acid		0.022	0.0203	ug/L	92	(70-130)	30	3.0
MBLK	Perfluorobutanesulfonic acid			<0.00059	ug/L				
MRL_CHK	Perfluorobutanesulfonic acid		0.0018	0.00125	ug/L	71	(50-150)		
MS_201810310303	Perfluorobutanesulfonic acid	ND	0.0018	0.00160	ug/L	89	(50-150)		
MSD_201810310303	Perfluorobutanesulfonic acid	ND	0.0018	0.00164	ug/L	91	(50-150)	50	2.2
LCS1	Perfluorodecanoic acid		0.025	0.0224	ug/L	90	(70-130)		
LCS2	Perfluorodecanoic acid		0.025	0.0222	ug/L	89	(70-130)	30	0.90
MBLK	Perfluorodecanoic acid			<0.000667	ug/L				
MRL_CHK	Perfluorodecanoic acid		0.002	0.00195	ug/L	98	(50-150)		
MS_201810310303	Perfluorodecanoic acid	ND	0.002	0.00194	ug/L	92	(50-150)		
MSD_201810310303	Perfluorodecanoic acid	ND	0.002	0.00201	ug/L	96	(50-150)	50	3.7
LCS1	Perfluorododecanoic acid		0.025	0.0220	ug/L	88	(70-130)		
LCS2	Perfluorododecanoic acid		0.025	0.0213	ug/L	85	(70-130)	30	3.2
MBLK	Perfluorododecanoic acid			<0.000667	ug/L				
MRL_CHK	Perfluorododecanoic acid		0.002	0.00186	ug/L	93	(50-150)		
MS_201810310303	Perfluorododecanoic acid	ND	0.002	0.00196	ug/L	96	(50-150)		
MSD_201810310303	Perfluorododecanoic acid	ND	0.002	0.00187	ug/L	92	(50-150)	50	4.4
LCS1	Perfluoroheptanoic acid		0.025	0.0222	ug/L	89	(70-130)		
LCS2	Perfluoroheptanoic acid		0.025	0.0225	ug/L	90	(70-130)	30	1.3
MBLK	Perfluoroheptanoic acid			<0.000667	ug/L				
MRL_CHK	Perfluoroheptanoic acid		0.002	0.00200	ug/L	100	(50-150)		
MS_201810310303	Perfluoroheptanoic acid	ND	0.002	0.00204	ug/L	95	(50-150)		
MSD_201810310303	Perfluoroheptanoic acid	ND	0.002	0.00194	ug/L	90	(50-150)	50	4.8
LCS1	Perfluorohexanesulfonic acid		0.023	0.0210	ug/L	92	(70-130)		

Spike recovery is already corrected for native results.

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RPD not calculated for LCS2 when different a concentration than LCS1 is used.

RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).

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Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
LCS2	Perfluorohexanesulfonic acid		0.023	0.0213	ug/L	93	(70-130)	30	1.4
MBLK	Perfluorohexanesulfonic acid			<0.000608	ug/L				
MRL_CHK	Perfluorohexanesulfonic acid		0.0018	0.00196	ug/L	108	(50-150)		
MS_201810310303	Perfluorohexanesulfonic acid	ND	0.0018	0.00181	ug/L	98	(50-150)		
MSD_201810310303	Perfluorohexanesulfonic acid	ND	0.0018	0.00187	ug/L	101	(50-150)	50	3.5
LCS1	Perfluorohexanoic acid		0.025	0.0220	ug/L	88	(70-130)		
LCS2	Perfluorohexanoic acid		0.025	0.0221	ug/L	88	(70-130)	30	0.45
MBLK	Perfluorohexanoic acid			<0.000667	ug/L				
MRL_CHK	Perfluorohexanoic acid		0.002	0.00181	ug/L	91	(50-150)		
MS_201810310303	Perfluorohexanoic acid	ND	0.002	0.00207	ug/L	99	(50-150)		
MSD_201810310303	Perfluorohexanoic acid	ND	0.002	0.00208	ug/L	100	(50-150)	50	0.53
LCS1	Perfluorononanoic acid		0.025	0.0225	ug/L	90	(70-130)		
LCS2	Perfluorononanoic acid		0.025	0.0226	ug/L	90	(70-130)	30	0.44
MBLK	Perfluorononanoic acid			<0.000667	ug/L				
MRL_CHK	Perfluorononanoic acid		0.002	0.00204	ug/L	102	(50-150)		
MS_201810310303	Perfluorononanoic acid	ND	0.002	0.00204	ug/L	95	(50-150)		
MSD_201810310303	Perfluorononanoic acid	ND	0.002	0.00210	ug/L	98	(50-150)	50	3.1
LCS1	Perfluoroctanesulfonic acid		0.023	0.0210	ug/L	91	(70-130)		
LCS2	Perfluoroctanesulfonic acid		0.023	0.0207	ug/L	89	(70-130)	30	1.4
MBLK	Perfluoroctanesulfonic acid			<0.000617	ug/L				
MRL_CHK	Perfluoroctanesulfonic acid		0.0019	0.00192	ug/L	104	(50-150)		
MS_201810310303	Perfluoroctanesulfonic acid	ND	0.0019	0.00202	ug/L	107	(50-150)		
MSD_201810310303	Perfluoroctanesulfonic acid	ND	0.0019	0.00185	ug/L	97	(50-150)	50	8.8
LCS1	Perfluoroctanoic acid		0.025	0.0233	ug/L	93	(70-130)		
LCS2	Perfluoroctanoic acid		0.025	0.0225	ug/L	90	(70-130)	30	3.5
MBLK	Perfluoroctanoic acid			<0.000667	ug/L				
MRL_CHK	Perfluoroctanoic acid		0.002	0.00215	ug/L	107	(50-150)		
MS_201810310303	Perfluoroctanoic acid	ND	0.002	0.00203	ug/L	94	(50-150)		
MSD_201810310303	Perfluoroctanoic acid	ND	0.002	0.00203	ug/L	94	(50-150)	50	0.20
LCS1	Perfluorotetradecanoic acid		0.025	0.0227	ug/L	91	(70-130)		
LCS2	Perfluorotetradecanoic acid		0.025	0.0182	ug/L	73	(70-130)	30	22
MBLK	Perfluorotetradecanoic acid			<0.000667	ug/L				
MRL_CHK	Perfluorotetradecanoic acid		0.002	0.00209	ug/L	104	(50-150)		
MS_201810310303	Perfluorotetradecanoic acid	ND	0.002	0.00191	ug/L	82	(50-150)		
MSD_201810310303	Perfluorotetradecanoic acid	ND	0.002	0.00188	ug/L	80	(50-150)	50	1.7
LCS1	Perfluorotridecanoic acid		0.025	0.0212	ug/L	85	(70-130)		
LCS2	Perfluorotridecanoic acid		0.025	0.0213	ug/L	85	(70-130)	30	0.47
MBLK	Perfluorotridecanoic acid			<0.000667	ug/L				

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

RPD not calculated for LCS2 when different a concentration than LCS1 is used.

RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).

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Report: 771346
Project: EDC-PPCP
Group: EPA 537

Tucson City of

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
MRL_CHK	Perfluorotridecanoic acid		0.002	0.00188	ug/L	94	(50-150)		
MS_201810310303	Perfluorotridecanoic acid	ND	0.002	0.00194	ug/L	95	(50-150)		
MSD_201810310303	Perfluorotridecanoic acid	ND	0.002	0.00190	ug/L	93	(50-150)	50	1.8
LCS1	Perfluoroundecanoic acid		0.025	0.0222	ug/L	89	(70-130)		
LCS2	Perfluoroundecanoic acid		0.025	0.0215	ug/L	86	(70-130)	30	3.2
MBLK	Perfluoroundecanoic acid			<0.000667	ug/L				
MRL_CHK	Perfluoroundecanoic acid		0.002	0.00184	ug/L	92	(50-150)		
MS_201810310303	Perfluoroundecanoic acid	ND	0.002	0.00185	ug/L	91	(50-150)		
MSD_201810310303	Perfluoroundecanoic acid	ND	0.002	0.00178	ug/L	87	(50-150)	50	3.9

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

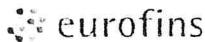
Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

RPD not calculated for LCS2 when different a concentration than LCS1 is used.

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(S) - Indicates surrogate compound.

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Eaton Analytical

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Website: www.EatonAnalytical.com

CHAIN OF CUSTODY RECORD

771746

EUROFINS EATON ANALYTICAL USE ONLY:

LOGIN COMMENTS: _____

SAMPLES CHECKED AGAINST COC BY: _____

SAMPLE TEMP RECEIVED AT: _____

SAMPLES LOGGED IN BY: CC Colton / No. California / Arizona

°C (Compliance: 4 ± 2 °C)

 Monrovia

1.5 °C (Compliance: 4 ± 2 °C)

SAMPLES REC'D DAY OF COLLECTION? (check for yes)CONDITION OF BLUE ICE: Frozen Partially Frozen Thawed Wet Ice No Ice

METHOD OF SHIPMENT: Pick-Up / Walk-In / FedEx / UPS / DHL / Area Fast / Top Line / Other: _____

TO BE COMPLETED BY SAMPLER:

COMPANY/AGENCY NAME: TUCSON WATER DEPARTMENT		PROJECT CODE: EDC-PPCP		COMPLIANCE SAMPLES <input type="checkbox"/> - Requires state forms <input type="checkbox"/>		NON-COMPLIANCE SAMPLES <input checked="" type="checkbox"/>			
EEA CLIENT CODE: TUCSONWATER		COC ID:		SAMPLE GROUP: EPA 537		REGULATION INVOLVED: (eg. SDWA, Phase V, NPDES, FDA,...)			
TAT requested: rush by adv notice only STD <input type="checkbox"/> 1 wk <input checked="" type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input type="checkbox"/> 1 day <input type="checkbox"/>									
SAMPLE DATE	SAMPLE TIME	SAMPLE ID	CLIENT LAB ID	MATRIX	FIELD DATA	FIELD DATA	SAMPLER COMMENTS Current SP1 DATE		
10/18/18 08:44	198R	L181453-01	CFW		2		10/30/18		
10/18/18 09:08	SP-830	L181453-02	CFW		2		10/30/18		
10/18/18 09:27	SP-810	L181453-03	CFW		2		10/30/18		
10/18/18 09:54	SP-790	L181453-04	CFW		2		10/30/18		
10/18/18 10:10	SP-210	L181453-05	CFW		2		10/30/18		
10/18/18 08:21	TA-030A	L181453-06	RGW		2		10/30/18		
10/18/18 08:44	TA-050T	L181453-07	FW		2		10/30/18		
10/18/18 08:44	FIELD BLANK TA-050T	L181453-08			1		10/30/18		
10/18/18 08:06	TP-021T	L181453-09	CFW		2		10/30/18		
10/18/18 07:41	A-060A	L181453-10	CFW		2		10/30/18		

* MATRIX TYPES: RSW = Raw Surface Water
RGW = Raw Ground Water

CFW = Chlor(am)inated Finished Water
FW = Other Finished Water

SEAW = Sea Water
WW = Waste Water

BW = Bottled Water
SW = Storm Water

O = Other - Please Identify

SL = Sludge

SIGNATURE

PRINT NAME Victor PlasenciaCOMPANY/TITLE EFADATE 11/12/18

TIME

SAMPLED BY: <u>Charles A. Carroll</u>	CHARLES PARROU L	TUCSON WATER / CHEMIST	<u>11/1/18</u>	<u>10:15</u>
RELINQUISHED BY: <u>Charles A. Carroll</u>	CHARLES PARROU L	TUCSON WATER / CHEMIST	<u>11/1/18</u>	<u>10:15</u>
RECEIVED BY: <u>Diane Frazer</u>	DIANE FRAZER	TUCSON WATER / ANALYST	<u>11-1-18</u>	<u>1020</u>
RELINQUISHED BY: <u>Diane Frazer</u>	DIANE FRAZER	TUCSON WATER / ANALYST	<u>11-1-18</u>	<u>1500</u>
RECEIVED BY: <u>UPS 12 YR8 026 019025 8209</u>			<u>11-1-18</u>	<u>1500</u>



Eaton Analytical

CHAIN OF CUSTODY RECORD

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800 566 LABS (800 566 5227)

Website: www.EatonAnalytical.com

LOGIN COMMENTS: _____	SAMPLES CHECKED AGAINST COC BY: _____
_____	SAMPLES LOGGED IN BY: _____
SAMPLE TEMP RECEIVED AT:	SAMPLES REC'D DAY OF COLLECTION? <input type="checkbox"/> (check for yes)
<input type="checkbox"/> Colton / No. California / Arizona	_____ °C (Compliance: 4 ± 2 °C)
<input type="checkbox"/> Monrovia	_____ °C (Compliance: 4 ± 2 °C)
CONDITION OF BLUE ICE: Frozen _____ Partially Frozen _____ Thawed _____ Wet Ice _____ No Ice _____	
METHOD OF SHIPMENT: Pick-Up / Walk-In / FedEx / UPS / DHL / Area Fast / Top Line / Other: _____	

TO BE COMPLETED BY SAMPLER:

* MATRIX TYPES: RSW = Raw Surface Water
RGW = Raw Ground Water

CFW = Chlor(am)inated Finished Water
FW = Other Finished Water

SEAW = Sea Water
WW = Waste Water

BW = Bottled Water
SW = Storm Water

O = Other - Please Identify

SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
SAMPLED BY: Charles A. Carroll	CHARLES PARROLL	TUCSON WATER / CHEMIST	11/1/18	10:15
RELINQUISHED BY: Charles A. Carroll	CHARLES CARROLL	TUCSON WATER / CHEMIST	11/1/18	10:15
RECEIVED BY: Diane Frayer	DIANE FRAZER	TUCSON WATER / ANALYST	11-1-18	10:20
RELINQUISHED BY: Diane Frayer	DIANE FRAZER	TUCSON WATER / ANALYST	11-1-18	15:00
RECEIVED BY: UPS 12X R8 D26 0190258209			11-1-18	15:00